## AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently amended) A memory device comprising:

a first electrode;

a functional media formed over the first electrode, the functional media stores information based on a change of an impedance state, ~~of the functional media changes~~ the impedance state of the functional media changes based on a migration of electrons or holes when subject to an external electric field or light radiation, the impedance state indicative of information content; and

a second electrode formed over the functional media.

2. (Original) The memory device of claim 1, wherein the functional media comprises at least one of an active layer and a passive layer.

3. (Original) The memory device of claim 1, wherein the first electrode or the second electrode comprises at least one selected from the group of tungsten, silver, copper, titanium, chromium, germanium, gold, aluminum, magnesium, manganese, indium, iron, nickel, palladium, platinum, zinc, alloys thereof, indium-tin oxide, conductive oxides, polysilicon, doped amorphous silicon, metal silicides, and various copper composition alloys.

4. (Original) The memory device of claim 1, wherein the first electrode or the second electrode comprise at least one selected from the group of conducting polymers, semi-conducting polymers, PEDOT/PSS, polyaniline, polythiothene material, doped conducting organic polymers, doped semiconducting organic polymers, undoped conducting organic polymers, undoped semiconducting organic polymers, oligomers, monomers, conducting metal oxides, conducting metal nitrides, conducting metal silicides,

semiconducting metal oxides, semiconducting metal nitrides, semiconducting metal silicides, and conductive organic polymers.

5. (Original) The memory device of claim 1, wherein the first electrode or the second electrode comprise amorphous carbon.

6. (Original) The memory device of claim 1, wherein the first electrode or the second electrode comprise at least one of optically transparent oxide and sulfide material.

7. (Original) The memory device of claim 2, wherein the active layer comprises at least one of an organic, metal organic, and non organic material.

8. (Original) The memory device of claim 2, wherein the active layer comprises at least one selected from the group of polydiphenylacetylene, poly(t-butyl)diphenylacetylene, poly(trifluoromethyl)diphenylacetylene, polybis-trifluoromethyl)acetylene, polybis(t-butyldiphenyl)acetylene, poly(trimethylsilyl) diphenylacetylene, poly(carbazole)diphenylacetylene, polydiacetylene, polyphenylacetylene, polypyridineacetylene, polymethoxyphenylacetylene, polymethylphenylacetylene, poly(t-butyl)phenylacetylene, polynitro-phenylacetylene, poly(trifluoromethyl) phenylacetylene, poly(trimethylsilyl)pheylacetylene, polydipyrrylmethane, polyindoqiunone, polydihydroxyindole, polytrihydroxyindole, furane-polydihydroxyindole, polyindoqiunone-2- carboxyl, polyindoqiunone monohydrate, polybenzobisthiazole, and poly(p-phenylene sulfide).

9. (Original) The memory device of claim 2, wherein the active layer comprises at least one of: materials of a nitro group, materials of an amino group, cyclopentadienyl, dithiolane, metilcyclopentadienyl, fulvalenediyl, indenyl, fluorenyl, cyclobis(paraquart-p- phenylene), bipyridinium, phenothiazine,

diazapyrenium, benzonitrile, benzonate, benzamide, carbazole, dibenzothiophene, nitrobenzene, aminobenzenesulfonate, and amonobenzanate.

10. (Original) The memory device of claim 2, wherein the active layer comprises molecular units with redox-active metals.

11. (Original) The memory device of claim 10, wherein the redox active metals comprise at least one of metallocenes complex and polypyridine metal complex.

12. (Original) The memory device of claim 2, wherein the active layer comprises at least one selected from the group of polyaniline, polythiophene, polypyrrole, polysilane, polystyrene, polyfuran, polyindole, polyazulene, polyphenylene, polypyridine, polybipyridine, polyphthalocyanine, polysexithiofene, poly(siliconoxohemiporphyrazine), poly(germaniumoxohemiporphyrazine), and poly(ethylenedioxythiophene).

13. (Original) The memory device of claim 2, wherein active layer comprises at least one selected from the group of aromatic hydrocarbons; organic molecules with donor and acceptor properties, metallo-organic complexes; porphyrin, phthalocyanine, and hexadecafluoro phthalocyanine.

14. (Original) The memory device of claim 13, wherein the organic molecules with donor acceptor properties comprises at least one selected from the group of N-Ethylcarbazole, tetrathiotetracene, tetrathiofulvalene, tetracyanoquinodimethane, tetracyanoethylene, cloranol, and dinitro-n phenyl.

15. (Original) The memory device of claim 13, wherein the metallo-organic complexes are selected from the group of bisdiphenylglyoxime, bisorthophenylenediimine, and tetraaza-tetramethylannulene.

16. (Original) The memory device of claim 2, wherein the active layer comprises organic material selected from the group comprising of polyacetylene, polyphenylacetylene, polydiphenylacetylene, polyaniline, poly(p-phenylene vinylene), polythiophene, polyporphyrins, porphyrinic macrocycles, thiol derivatized polyporphyrins, polymetallocenes, polyferrocenes, polyphthalocyanines, polyvinylenes, and polystiroles.

17. (Original) The memory device of claim 2, wherein the active layer comprises material selected from the group comprising of electric dipole elements, polymer ferroelectrics clusters, non-organic ferro-electrics, salts, alkalis, acids, and water molecules.

18. (Original) The memory device of claim 2, wherein the active layer comprises material that can dissociate in at least one of an electrical field and under light radiation.

19. (Original) The memory device of claim 18, wherein the material that can dissociate on anions that are selected from the group consisting of I, Br, Cl, F, $ClO_4$, $AlCl_4$, $PF_6$, $AsF_6$, $AsF_4$, $SO_3CF_3$, $BF_4$, $BCl_4$, $NO_3$, $POF_4$, CN, $SiF_3$, $SiF_6$, $SO_4$, $CH_3CO_2$, $C_6H_5CO_2$, $CH_3C_6H_4SO_3$, $CF_3SO_3$, $N(SO_3CF_3)_2$, $N(CF_3SO_2)(C_4F_9SO_2)$, $N(C_4F_9SO_2)_2$, alkylphosphate, organoborate, bis-(4-nitrophenil) sulfonilimide, and poly(styrene sulfonate)(polyanions).

20. (Original) The memory device of claim 18, wherein the material that can dissociate on cations that are selected from the group consisting of Li, Na, K, Rb, Cs, Ag, Ca, Mg, Zn, Fe, Cu, H, and $NH_4$.

21. (Original) The memory device of claim 1, wherein the functional media comprises porous dielectric material.

22. (Original) The memory device of claim 21, wherein the porous dielectric material is selected from the group consisting of Si, amorphous Si, silicon dioxide ($SiO_2$), aluminum oxide ($Al_2O_3$), copper oxide ($Cu_2O$), titanium dioxide ($TiO_2$), boron nitride (BN), vanadium oxide ($V_2O_3$), carbon tri-nitride ($CN_3$), ferroelectric materials and barium-strontium titanate ((Ba, Sr) $TiO_3$).

23. (Original) The memory device of claim 1, thicknesses of the first electrode and the second electrode being at least about 0.01 $\mu$m or at most about 10 $\mu$m.

24. (Original) The device of claim 2, the active layer having a thickness of at least about 0.001 $\mu$m or at most about 5 $\mu$m.

25. (Original) The device of claim 2, a thickness of the active layer is about 10 to about 500 times greater than a thickness of the passive layer.

26. (Withdrawn) A method of fabricating the memory device of claim 1, comprising:

forming a first electrode on a substrate;

forming a passive layer of the functional media on the first electrode;

forming an active layer of the functional media on the passive layer; and

forming a second electrode on the active layer.

27. (Withdrawn) The method of claim 26 further comprising forming the active layer *via* a chemical vapor deposition process.

28. (Withdrawn) The method of claim 26 further comprising forming the active layer *via* a gas phase reaction process.

29. (Withdrawn) The method of claim 26, further comprising forming the active layer formed *via* a spin coating process or a liquid phase reaction process.

30. (Withdrawn) The method of claim 26, further comprising applying a first voltage to the first non-copper electrode and the second electrode, to set an impedance state of the organic memory device, the impedance state representing information content.

31. (Withdrawn) The method of claim 26, further comprising applying a second voltage to the first electrode and the second electrode to determine an impedance state of the memory device, the impedance state representing information content.

32. (Cancelled)

33. (Previously presented) A memory device comprising:

a first electrode;

a functional media formed over the first electrode, the functional media comprising a passive and active layer that exchange electrons or holes to change an impedance state of the memory device and store information content, the impedance state changes based on a migration of electrons or holes when subject to an external electric field or light radiation; and

a second electrode formed over the functional media.